# Test Report
## Quality of Bitumen

| | |
|---|---|
| **Project Name** | 1. Improvement of drain at thirumenahalli village main road in ward no 05 byatarayanapura sub division.2) Improvement of road and drain at thirumenahalli junction to agrahara layout govt hospital in ward no05 byatarayanapura sub division 3)Improvement of roads and drain at chokkanahalli village main road cross road in ward no 05 byatarayanapura sub division 4) Improvement of roads and drain at markendeyanagara main road and cross roads in ward no 05 byatarayanapura sub division 5) Improvement of roads and drain at sriraj layout main road and cross road in ward no 05 byatarayanapura sub division 6) Improvement of roads and drain at kogilu surrounding in ward no 05 byatarayanapura sub division 7)Improvement of roads and drain at agrahara village cross roads in ward no 05 byatarayanapura sub division 8) Improvement of roads and drain at agrahara layout kallappa reddy main road in ward no 05 byatarayanapura sub division |
| **Client** | Executive Engineer Project Division Yelahanka Zone |
| **Job No** | MCTPL/BBMP/Project Division Yelahanka Zone /PMC/2018-19/QR/P-9/03 |
| **Mix Type** | Bituminous Concrete (BC) |
| **Contractor** | Sri. S.K. CHANDRA |
| **Test Method** | IS : 73 – 2013 (Paving Bitumen) & Specification for Road & Bridge Works, MORT&H, Revision V. |
| **Grade of Bitumen** | VG30 |
| **Location** | Hot Mix Plant |
| **Material** | Bitumen |
| **Sample No** | 1 |
| **Date** | 6-Mar-2019 |

| Sl. No. | Description | Test Results | Requirement as per IS:73 - 1992 |
|---|---|---|---|
| 1 | Penetration at 25$^0$C , 1 / 10 mm | 65 | 60 – 70 |
| 2 | Softening Point, ($^0$C) | 53 | 45 – 55 |
| 3 | Specific Gravity | 1.1 | Min. 0.97 |
| 4 | Ductility at 27$^0$C, in cm | 79 | Min. 75 |
| 5 | Flash Point, ($^0$C) | 181 | Min. 175 |

**Note:**

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**For Mecadez Core Technologies Private Limited**

**Authorised Signature**

Asst. Executive Engineer
Project Division
Yelahanka Zone
Bangalore

# Test Report
## Quality of Bitumen

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|---|---|
| **Project Name** | 1. Improvement of drain at thirumenahalli village main road in ward no 05 byatarayanapura sub division.2) Improvement of road and drain at thirumenahalli junction to agrahara layout govt hospital in ward no05 byatarayanapura sub division 3)Improvement of roads and drain at chokkanahalli village main road cross road in ward no 05 byatarayanapura sub division 4) Improvement of roads and drain at markendeyanagara main road and cross roads in ward no 05 byatarayanapura sub division 5) Improvement of roads and drain at sriraj layout main road and cross road in ward no 05 byatarayanapura sub division 6) Improvement of roads and drain at kogilu surrounding in ward no 05 byatarayanapura sub division 7)Improvement of roads and drain at agrahara village cross roads in ward no 05 byatarayanapura sub division 8) Improvement of roads and drain at agrahara layout kallappa reddy main road in ward no 05 byatarayanapura sub division |
| **Client** | Executive Engineer Project Division Yelahanka Zone |
| **Job No** | MCTPL/BBMP/Project Division Yelahanka Zone /PMC/2018-19/QR/P-9/03 |
| **Mix Type** | Bituminous Concrete (BC) |
| **Contractor** | Sri. S.K. CHANDRA |
| **Test Method** | IS : 73 – 2013 (Paving Bitumen) & Specification for Road & Bridge Works, MORT&H, Revision V. |
| **Grade of Bitumen** | VG30 |
| **Location** | Hot Mix Plant |
| **Material** | Bitumen |
| **Sample No** | 2 |
| **Date** | 6-Mar-2019 |

| Sl. No. | Description | Test Results | Requirement as per IS:73 - 1992 |
|---|---|---|---|
| 1 | Penetration at $25^0$C , 1 / 10 mm | 64 | 60 – 70 |
| 2 | Softening Point, ($^0$C) | 52 | 45 – 55 |
| 3 | Specific Gravity | 1.1 | Min. 0.97 |
| 4 | Ductility at $27^0$C, in cm | 80 | Min. 75 |
| 5 | Flash Point, ($^0$C) | 180 | Min. 175 |

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**Authorised Signature**

Asst. Executive Engineer
Project Division
Yelahanka Zone
Bangalore

# Test Report
## Rate of Spread of Tack Coat

| | |
|---|---|
| **Project Name** | 1. Improvement of drain at thirumenahalli village main road in ward no 05 byatarayanapura sub division.2) Improvement of road and drain at thirumenahalli junction to agrahara layout govt hospital in ward no05 byatarayanapura sub division 3)Improvement of roads and drain at chokkanahalli village main road cross road in ward no 05 byatarayanapura sub division 4) Improvement of roads and drain at markendeyanagara main road and cross roads in ward no 05 byatarayanapura sub division 5) Improvement of roads and drain at sriraj layout main road and cross road in ward no 05 byatarayanapura sub division 6) Improvement of roads and drain at kogilu surrounding in ward no 05 byatarayanapura sub division 7)Improvement of roads and drain at agrahara village cross roads in ward no 05 byatarayanapura sub division 8) Improvement of roads and drain at agrahara layout kallappa reddy main road in ward no 05 byatarayanapura sub division |
| **Client** | Executive Engineer Project Division Yelahanka Zone |
| **Job No** | MCTPL/BBMP/Project Division Yelahanka Zone /PMC/2018-19/QR/P-9/03 |
| **Mix Type** | Bituminous Concrete (BC) |
| **Contractor** | Sri. S.K. CHANDRA |
| **Location** | At Site |
| **Material** | Bitumen |
| **Sample No** | 1 |
| **Date** | 11-Mar-2019 |

| Sl. No. | Determination | Unit | Test No 1 | | |
|---|---|---|---|---|---|
| | | | Longitudinal Distribution | | |
| 1 | Size of Plate (mxn) | $m^2$ | 0.2x0.2 | 0.2x0.2 | 0.2x0.2 |
| 2 | Area of the Plate (a) | $m^2$ | 0.04 | 0.04 | 0.04 |
| 3 | Initial weight of the empty Plate (b) | kg | 1.641 | 1.641 | 1.641 |
| 4 | Final weight of plate after application of Tack Coat (c) | kg | 1.653 | 1.652 | 1.655 |
| 5 | Weight of Prime coat/ Tack Coat (d = c-b ) | kg | 0.012 | 0.011 | 0.014 |
| 6 | Rate of spread (d/a) | kg / $m^2$ | 0.300 | 0.275 | 0.350 |
| 7 | Average | kg / $m^2$ | 0.308 | | |
| 8 | Specified Limit | kg / $m^2$ | Not less than 0.25 kg / $m^2$ | | |

**Results:** Rate of Spread of Prime Coat / Tack Coat is: 0.308 kg / m2

**Note:**

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Asst. Executive Engineer
Project Division
Yelahanka Zone
Bangalore

# Test Report
## Rate of Spread of Tack Coat

| | |
|---|---|
| **Project Name** | 1. Improvement of drain at thirumenahalli village main road in ward no 05 byatarayanapura sub division.2) Improvement of road and drain at thirumenahalli junction to agrahara layout govt hospital in ward no05 byatarayanapura sub division 3)Improvement of roads and drain at chokkanahalli village main road cross road in ward no 05 byatarayanapura sub division 4) Improvement of roads and drain at markendeyanagara main road and cross roads in ward no 05 byatarayanapura sub division 5) Improvement of roads and drain at sriraj layout main road and cross road in ward no 05 byatarayanapura sub division 6) Improvement of roads and drain at kogilu surrounding in ward no 05 byatarayanapura sub division 7)Improvement of roads and drain at agrahara village cross roads in ward no 05 byatarayanapura sub division 8) Improvement of roads and drain at agrahara layout kallappa reddy main road in ward no 05 byatarayanapura sub division |
| **Client** | Executive Engineer Project Division Yelahanka Zone |
| **Job No** | MCTPL/BBMP/Project Division Yelahanka Zone /PMC/2018-19/QR/P-9/03 |
| **Mix Type** | Bituminous Concrete (BC) |
| **Contractor** | Sri. S.K. CHANDRA |
| **Location** | At Site |
| **Material** | Bitumen |
| **Sample No** | 2 |
| **Date** | 11-Mar-2019 |

| Sl. No. | Determination | Unit | Test No 1 | | |
|---|---|---|---|---|---|
| | | | Longitudinal Distribution | | |
| 1 | Size of Plate (mxn) | $m^2$ | 0.2x0.2 | 0.2x0.2 | 0.2x0.2 |
| 2 | Area of the Plate (a) | $m^2$ | 0.04 | 0.04 | 0.04 |
| 3 | Initial weight of the empty Plate (b) | kg | 1.641 | 1.641 | 1.641 |
| 4 | Final weight of plate after application of Tack Coat (c) | kg | 1.652 | 1.651 | 1.654 |
| 5 | Weight of Prime coat/ Tack Coat (d = c-b ) | kg | 0.011 | 0.01 | 0.013 |
| 6 | Rate of spread (d/a) | kg / $m^2$ | 0.275 | 0.25 | 0.325 |
| 7 | Average | kg / $m^2$ | 0.283 | | |
| 8 | Specified Limit | kg / $m^2$ | Not less than 0.25 kg / $m^2$ | | |

**Results:** Rate of Spread of Prime Coat / Tack Coat is: 0.283 kg / m2

**Note:**

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Asst. Executive Engineer
Project Division
Yelahanka Zone
Bangalore

# Test Report
## Rate of Spread of Tack Coat

| | |
|---|---|
| **Project Name** | 1. Improvement of drain at thirumenahalli village main road in ward no 05 byatarayanapura sub division.2) Improvement of road and drain at thirumenahalli junction to agrahara layout govt hospital in ward no05 byatarayanapura sub division 3)Improvement of roads and drain at chokkanahalli village main road cross road in ward no 05 byatarayanapura sub division 4) Improvement of roads and drain at markendeyanagara main road and cross roads in ward no 05 byatarayanapura sub division 5) Improvement of roads and drain at sriraj layout main road and cross road in ward no 05 byatarayanapura sub division 6) Improvement of roads and drain at kogilu surrounding in ward no 05 byatarayanapura sub division 7)Improvement of roads and drain at agrahara village cross roads in ward no 05 byatarayanapura sub division 8) Improvement of roads and drain at agrahara layout kallappa reddy main road in ward no 05 byatarayanapura sub division |
| **Client** | Executive Engineer Project Division Yelahanka Zone |
| **Job No** | MCTPL/BBMP/Project Division Yelahanka Zone /PMC/2018-19/QR/P-9/03 |
| **Mix Type** | Bituminous Concrete (BC) |
| **Contractor** | Sri. S.K. CHANDRA |
| **Location** | At Site |
| **Material** | Bitumen |
| **Sample No** | 3 |
| **Date** | 11-Mar-2019 |

| Sl. No. | Determination | Unit | Test No 1 | | |
|---|---|---|---|---|---|
| | | | Longitudinal Distribution | | |
| 1 | Size of Plate (mxn) | $m^2$ | 0.2x0.2 | 0.2x0.2 | 0.2x0.2 |
| 2 | Area of the Plate (a) | $m^2$ | 0.04 | 0.04 | 0.04 |
| 3 | Initial weight of the empty Plate (b) | kg | 1.641 | 1.641 | 1.641 |
| 4 | Final weight of plate after application of Tack Coat (c) | kg | 1.652 | 1.652 | 1.655 |
| 5 | Weight of Prime coat/ Tack Coat (d = c-b ) | kg | 0.011 | 0.011 | 0.014 |
| 6 | Rate of spread (d/a) | kg / $m^2$ | 0.275 | 0.275 | 0.35 |
| 7 | Average | kg / $m^2$ | 0.317 | | |
| 8 | Specified Limit | kg / $m^2$ | Not less than 0.25 kg / $m^2$ | | |

**Results:** Rate of Spread of Prime Coat / Tack Coat is: 0.317 kg / m2

**Note:**

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Asst. Executive Engineer
Project Division
Yelahanka Zone

# Test Report
## Aggregate Impact Value

| | |
|---|---|
| **Project Name** | 1. Improvement of drain at thirumenahalli village main road in ward no 05 byatarayanapura sub division.2) Improvement of road and drain at thirumenahalli junction to agrahara layout govt hospital in ward no05 byatarayanapura sub division 3)Improvement of roads and drain at chokkanahalli village main road cross road in ward no 05 byatarayanapura sub division 4) Improvement of roads and drain at markendeyanagara main road and cross roads in ward no 05 byatarayanapura sub division 5) Improvement of roads and drain at sriraj layout main road and cross road in ward no 05 byatarayanapura sub division 6) Improvement of roads and drain at kogilu surrounding in ward no 05 byatarayanapura sub division 7)Improvement of roads and drain at agrahara village cross roads in ward no 05 byatarayanapura sub division 8) Improvement of roads and drain at agrahara layout kallappa reddy main road in ward no 05 byatarayanapura |
| **Client** | Executive Engineer Project Division Yelahanka Zone |
| **Job No** | MCTPL/BBMP/Project Division Yelahanka Zone /PMC/2018-19/QR/P-9/03 |
| **Mix Type** | Bituminous Concrete (BC) |
| **Contractor** | Sri. S.K. CHANDRA |
| **Test Method** | IS : 2386 (Part - 4) 1963 & Specification for Road & Bridge Works, MORT&H, Rev. V. |
| **Location** | At Site |
| **Material** | Coarse Aggregate |
| **Sample No** | 1 |
| **Date** | 8-Mar-2019 |

| Sl. No. | Determination | Unit | Trails | |
|---|---|---|---|---|
| 1 | Weight of empty cylinder, w1 | gm | 960 | 960 |
| 2 | Weight of container filled with Aggregate, w2 | gm | 1309 | 1308 |
| 3 | Weight of the Aggregate before compaction, (w2 - w1) = w3 | gm | 349 | 348 |
| 4 | Weight of the sample passing through 2.36 mm IS sieves after Impact, w4 | gm | 83 | 82 |
| 5 | Weight of the sample retained on 2.36 mm IS sieve after Impact, w5 | gm | 266 | 266 |
| 6 | Aggregate Impact Value (w4 / w3 )x100 | % | 23.78 | 23.56 |
| 7 | Specified Limit | % | 24 | |

**Results:** Average Aggregate Impact Value: **23.67** %

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Yelahanka Zone
Bangalore

# Test Report
## Aggregate Particle Shape

| | |
|---|---|
| **Project Name** | 1. Improvement of drain at thirumenahalli village main road in ward no 05 byatarayanapura sub division.2) Improvement of road and drain at thirumenahalli junction to agrahara layout govt hospital in ward no05 byatarayanapura sub division 3)Improvement of roads and drain at chokkanahalli village main road cross road in ward no 05 byatarayanapura sub division 4) Improvement of roads and drain at markendeyanagara main road and cross roads in ward no 05 byatarayanapura sub division 5) Improvement of roads and drain at sriraj layout main road and cross road in ward no 05 byatarayanapura sub division 6) Improvement of roads and drain at kogilu surrounding in ward no 05 byatarayanapura sub division 7)Improvement of roads and drain at agrahara village cross roads in ward no 05 byatarayanapura sub division 8) Improvement of roads and drain at agrahara layout kallappa reddy main road in ward no 05 byatarayanapura sub division |
| **Client** | Executive Engineer Project Division Yelahanka Zone |
| **Job No** | MCTPL/BBMP/Project Division Yelahanka Zone /PMC/2018-19/QR/P-9/03 |
| **Mix Type** | Bituminous Concrete (BC) |
| **Contractor** | Sri. S.K. CHANDRA |
| **Test Method** | IS : 2386 (Part - 1) 1963 & Specification for Road & Bridge Works, MORT&H, Rev. V. |
| **Location** | Hot Mix Plant |
| **Material** | Coarse Aggregates |
| **Sample No** | 1 |
| **Date** | 8-Mar-2019 |

| I.S. Sieves Size | | Weight of Retained Sample on Each Sieve (minimum 200 Pieces) (gm) | Flakiness Index | | Elongation Index | |
|---|---|---|---|---|---|---|
| Passing through IS Sieves (mm) | Retained on IS Sieves (mm) | | Thickness Gauge | Weight of Aggregates in each fraction passing on thickness gauges (gm) | Length Gauge | Weight of Aggregates in Fraction retained on length gauges (gm) |
| 63 | 50 | 0 | 33.9 | 0 | - | 0 |
| 50 | 40 | 0 | 27 | 0 | 81 | 0 |
| 40 | 25 | 0 | 19.5 | 0 | 58.5 | 0 |
| 31.5 | 25 | 0 | 16.95 | 0 | - | 0 |
| 25 | 20 | 1555 | 13.5 | 235 | 40.5 | 253 |
| 20 | 16 | 1446 | 10.8 | 125 | 32.4 | 152 |
| 16 | 12.5 | 952 | 8.55 | 147 | 25.6 | 154 |
| 12.5 | 10 | 460 | 6.75 | 62 | 20.2 | 68 |
| 10 | 6.3 | 231 | 4.89 | 53 | 14.7 | 60 |
| | SW | 4644 | SWf | 622 | SWe | 687 |

**Flakiness Index** 13.39 %
**Elongation Index** 14.79 %
**Combined Flakiness and Elongation Indices :** 28.19 %

**Comments:** Maximum allowable Combined Flakiness and Elongation Indices for Bituminous Concrete is 35%.

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Asst. Executive Engineer
Project Division
Yelahanka Zone
BBMP, Bangalore

# Test Report
## Aggregate Stripping Value

| | |
|---|---|
| **Project Name** | 1. Improvement of drain at thirumenahalli village main road in ward no 05 byatarayanapura sub division.2) Improvement of road and drain at thirumenahalli junction to agrahara layout govt hospital in ward no05 byatarayanapura sub division 3)Improvement of roads and drain at chokkanahalli village main road cross road in ward no 05 byatarayanapura sub division 4) Improvement of roads and drain at markendeyanagara main road and cross roads in ward no 05 byatarayanapura sub division 5) Improvement of roads and drain at sriraj layout main road and cross road in ward no 05 byatarayanapura sub division 6) Improvement of roads and drain at kogilu surrounding in ward no 05 byatarayanapura sub division 7)Improvement of roads and drain at agrahara village cross roads in ward no 05 byatarayanapura sub division 8) Improvement of roads and drain at agrahara layout kallappa reddy main road in ward no 05 byatarayanapura sub division |
| **Client** | Executive Engineer Project Division Yelahanka Zone |
| **Job No** | MCTPL/BBMP/Project Division Yelahanka Zone /PMC/2018-19/QR/P-9/03 |
| **Mix Type** | Bituminous Concrete (BC) |
| **Contractor** | Sri. S.K. CHANDRA |
| **Test Method** | IS : 6241 - 1971 & Specification for Road & Bridge Works, MORT&H, Revision V. |
| **Location** | Hot Mix Plant |
| **Material** | Coarse Aggregates / Bitumen |
| **Sample No** | 1 |
| **Date** | 6-Mar-2019 |
| Type of Aggregate | Coarse Aggregate |
| Type of Binder | 60 / 70 Grade |
| Percentage of Binder Used | 5% by weight |
| Total weight of Aggregate | 200 gms |
| Total weight of Binder | 10 gms |
| Temperature of water bath | $40^0$C |

| Observation Number | Stripping Percentage | Average Percentage | Average Retained Coating (%) |
|---|---|---|---|
| 1 | 3.2 | 3.37 | 96.63 |
| 2 | 3.5 | | |
| 3 | 3.4 | | |

**Comments: Minimum allowable Aggregate Stripping Value for Bituminous Concrete is 95%**

**Note:**

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# Test Report
## Aggregate Stripping Value

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|---|---|
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| **Client** | Executive Engineer Project Division Yelahanka Zone |
| **Job No** | MCTPL/BBMP/Project Division Yelahanka Zone /PMC/2018-19/QR/P-9/03 |
| **Mix Type** | Bituminous Concrete (BC) |
| **Contractor** | Sri. S.K. CHANDRA |
| **Test Method** | IS : 6241 - 1971 & Specification for Road & Bridge Works, MORT&H, Revision V. |
| **Location** | Hot Mix Plant |
| **Material** | Coarse Aggregates / Bitumen |
| **Sample No** | 1 |
| **Date** | 6-Mar-2019 |
| Type of Aggregate | Coarse Aggregate |
| Type of Binder | 60 / 70 Grade |
| Percentage of Binder Used | 5% by weight |
| Total weight of Aggregate | 200 gms |
| Total weight of Binder | 10 gms |
| Temperature of water bath | $40^0$C |

| Observation Number | Stripping Percentage | Average Percentage | Average Retained Coating (%) |
|---|---|---|---|
| 1 | 3.2 | 3.37 | 96.63 |
| 2 | 3.5 | | |
| 3 | 3.4 | | |

**Comments: Minimum allowable Aggregate Stripping Value for Bituminous Concrete is 95%**

**Note:**

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Bangalore

# Test Report

## Specific Gravity and Water Absorption

| | |
|---|---|
| **Project Name** | 1. Improvement of drain at thirumenahalli village main road in ward no 05 byatarayanapura sub division.2) Improvement of road and drain at thirumenahalli junction to agrahara layout govt hospital in ward no05 byatarayanapura sub division 3)Improvement of roads and drain at chokkanahalli village main road cross road in ward no 05 byatarayanapura sub division 4) Improvement of roads and drain at markendeyanagara main road and cross roads in ward no 05 byatarayanapura sub division 5) Improvement of roads and drain at sriraj layout main road and cross road in ward no 05 byatarayanapura sub division 6) Improvement of roads and drain at kogilu surrounding in ward no 05 byatarayanapura sub division 7)Improvement of roads and drain at agrahara village cross roads in ward no 05 byatarayanapura sub division 8) Improvement of roads and drain at agrahara layout kallappa reddy main road in ward no 05 byatarayanapura sub division |
| **Client** | Executive Engineer Project Division Yelahanka Zone |
| **Job No** | MCTPL/BBMP/Project Division Yelahanka Zone /PMC/2018-19/QR/P- |
| **Mix Type** | Bituminous Concrete (BC) |
| **Contractor** | Sri. S.K. CHANDRA |
| **Test Method** | IS: 2386 (Part - 111) 1963 & Specification for Road & Bridge Works, MORT&H, Rev. V. |
| **Location** | Hot Mix Plant |
| **Material** | Coarse Aggregates |
| **Sample No** | 1 |
| **Date** | 6-Mar-2019 |

| Sl. No. | Particulars | Computations | Test Numbers | | Mean |
|---|---|---|---|---|---|
| | | | Test 1 | Test 2 | |
| 1 | Weight of Empty Basket Immersed in Water | $W_1$ g | 761 | 763 | |
| 2 | water | $W_2$g | 2045 | 2035 | |
| 3 | Weight of Saturated Aggregate in water | $W_s$g = $W_2$- $W_1$ | 1284 | 1272 | |
| 4 | Weight of saturated surface dry aggregate in Air | $W_3$ g | 2080 | 2060 | |
| 5 | Aggregate | $W_3$- $W_s$ | 796 | 788 | |
| 6 | Weight of Oven dried Aggregate | $W_4$g | 2041 | 2031 | |
| 7 | Specific Gravity | $W_4$/( $W_3$- $W_s$) | 2.56 | 2.58 | 2.57 |
| 8 | Apparent Specific Gravity | $W_4$/( $W_4$- $W_s$) | 2.70 | 2.68 | 2.69 |
| 9 | Water Absorption | ($W_4$- $W_3$)*100/ $W_4$ | 1.91 | 1.43 | 1.67 |

**Comments:** Maximum allowable Aggregate Water Absorption value for Bituminous Concrete is 2.0%.

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Yelahanka Zone
Bangalore

# Test Report
## Aggregate Gradation

| | |
|---|---|
| **Project Name** | 1. Improvement of drain at thirumenahalli village main road in ward no 05 byatarayanapura sub division.2) Improvement of road and drain at thirumenahalli junction to agrahara layout govt hospital in ward no05 byatarayanapura sub division 3)Improvement of roads and drain at chokkanahalli village main road cross road in ward no 05 byatarayanapura sub division 4) Improvement of roads and drain at markendeyanagara main road and cross roads in ward no 05 byatarayanapura sub division 5) Improvement of roads and drain at sriraj layout main road and cross road in ward no 05 byatarayanapura sub division 6) Improvement of roads and drain at kogilu surrounding in ward no 05 byatarayanapura sub division 7)Improvement of roads and drain at agrahara village cross roads in ward no 05 byatarayanapura sub division 8) Improvement of roads and drain at agrahara layout kallappa reddy main road in ward no 05 byatarayanapura sub division |
| **Client** | Executive Engineer Project Division Yelahanka Zone |
| **Job No** | MCTPL/BBMP/Project Division Yelahanka Zone /PMC/2018-19/QR/P-9/03 |
| **Mix Type** | Bituminous Concrete (BC) |
| **Contractor** | Sri. S.K. CHANDRA |
| **Test Method** | IS : 2386 (Part - 1) 1963 & Specification for Road & Bridge Works, MORT&H, Rev. V. |
| **Location** | Hot Mix Plant |
| **Material** | Coarse Aggregates |
| **Sample No** | 1 |
| **Date** | 8-Mar-2019 |

**Weight of Sample: 4000 gms**

| Sl. No. | I.S. Sieve size (mm) | Weight Retained (gm) | Percentage of weight Retained (%) | Cumulative Percentage of weight retained | Cumulative % of Passing | | Remarks |
|---|---|---|---|---|---|---|---|
| | | | | | Test Result | Gradation Limits as per MORT&H | |
| 1 | 19.00 | 0 | 0.00 | 0.00 | 100.00 | 100 | Gradation satisfies the MORT&H Grade II Specification for Bituminous Concrete |
| 2 | 13.20 | 673 | 16.83 | 16.83 | 83.18 | 72-100 | |
| 3 | 9.50 | 432 | 10.80 | 27.63 | 72.38 | 70-88 | |
| 4 | 4.75 | 231 | 5.78 | 33.40 | 66.60 | 53-71 | |
| 5 | 2.36 | 486 | 12.15 | 45.55 | 54.45 | 42-58 | |
| 6 | 1.18 | 345 | 8.63 | 54.18 | 45.83 | 34-48 | |
| 7 | 0.60 | 430 | 10.75 | 64.93 | 35.08 | 26-38 | |
| 8 | 0.30 | 436 | 10.90 | 75.83 | 24.18 | 18-28 | |
| 9 | 0.15 | 387 | 9.68 | 85.50 | 14.50 | 12-20) | |
| 10 | 0.075 | 365 | 9.13 | 94.63 | 5.37 | (4-10) | |

**Note:**

i. The results indicated above are based on the tests carried out on the sample at site.

ii. The results relate only to the items tested.

iii. This test report should not be reproduced except in full, without written approval of this laboratory.

iv. Any query regarding the report must be reported immediately.

**For Mecadez Core Technologies Private Limited**

**Authorised Signature**

Asst. Executive Engineer
Project Division
Yelahanka Zone
Bangalore

# Test Report
## Stability of Mix

| | |
|---|---|
| **Project Name** | 1. Improvement of drain at thirumenahalli village main road in ward no 05 byatarayanapura sub division.2) Improvement of road and drain at thirumenahalli junction to agrahara layout govt hospital in ward no05 byatarayanapura sub division 3)Improvement of roads and drain at chokkanahalli village main road cross road in ward no 05 byatarayanapura sub division 4) Improvement of roads and drain at markendeyanagara main road and cross roads in ward no 05 byatarayanapura sub division 5) Improvement of roads and drain at sriraj layout main road and cross road in ward no 05 byatarayanapura sub division 6) Improvement of roads and drain at kogilu surrounding in ward no 05 byatarayanapura sub division 7)Improvement of roads and drain at agrahara village cross roads in ward no 05 byatarayanapura sub division 8) Improvement of roads and drain at agrahara layout kallappa reddy main road in ward no 05 byatarayanapura sub division |
| **Client** | Executive Engineer Project Division Yelahanka Zone |
| **Job No** | MCTPL/BBMP/Project Division Yelahanka Zone /PMC/2018-19/QR/P-9/03 |
| **Mix Type** | Bituminous Concrete (BC) |
| **Contractor** | Sri. S.K. CHANDRA |
| **Test Method** | Specification for Road & Bridge Works, MORT&H, Revision V. |
| **Location** | Bay |
| **Material** | Bituminous Concrete mix |
| **Sample No** | 1 |
| **Date** | 10-Mar-2019 |

| Sl. No. | Description | Unit | Test 1 | Requirements as per MORT&H |
|---|---|---|---|---|
| 1 | Marshal Stability | KN | **9.3** | 9 KN (min) |
| 2 | Marshal Flow | mm | **3.5** | 2 – 4 mm |
| 3 | Percent of Air Voids in mix | % | **4.5** | 3 – 6 % |
| 4 | Percent of Voids in Mineral Aggregates filled with Bitumen | % | **72** | 65 – 75 % |
| 5 | Density | g/cc | **2.21** | 2.22 g/cc |

**Note:**

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Project Division
Yelahanka Zone
Bangalore

# Test Report
## Stability of Mix

| | |
|---|---|
| **Project Name** | 1. Improvement of drain at thirumenahalli village main road in ward no 05 byatarayanapura sub division.2) Improvement of road and drain at thirumenahalli junction to agrahara layout govt hospital in ward no05 byatarayanapura sub division 3)Improvement of roads and drain at chokkanahalli village main road cross road in ward no 05 byatarayanapura sub division 4) Improvement of roads and drain at markendeyanagara main road and cross roads in ward no 05 byatarayanapura sub division 5) Improvement of roads and drain at sriraj layout main road and cross road in ward no 05 byatarayanapura sub division 6) Improvement of roads and drain at kogilu surrounding in ward no 05 byatarayanapura sub division 7)Improvement of roads and drain at agrahara village cross roads in ward no 05 byatarayanapura sub division 8) Improvement of roads and drain at agrahara layout kallappa reddy main road in ward no 05 byatarayanapura sub division |
| **Client** | Executive Engineer Project Division Yelahanka Zone |
| **Job No** | MCTPL/BBMP/Project Division Yelahanka Zone /PMC/2018-19/QR/P-9/03 |
| **Mix Type** | Bituminous Concrete (BC) |
| **Contractor** | Sri. S.K. CHANDRA |
| **Test Method** | Specification for Road & Bridge Works, MORT&H, Revision V. |
| **Location** | Bay |
| **Material** | Bituminous Concrete mix |
| **Sample No** | 2 |
| **Date** | 10-Mar-2019 |

| Sl. No. | Description | Unit | Test 1 | Requirements as per MORT&H |
|---|---|---|---|---|
| 1 | Marshal Stability | KN | **9.4** | 9 KN (min) |
| 2 | Marshal Flow | mm | **3.6** | 2 – 4 mm |
| 3 | Percent of Air Voids in mix | % | **5.2** | 3 – 6 % |
| 4 | Percent of Voids in Mineral Aggregates filled with Bitumen | % | **74** | 65 – 75 % |
| 5 | Density | g/cc | **2.21** | 2.22 g/cc |

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Asst. Executive Engineer
Project Division
Yelahanka Zone
Bangalore

# Test Report
## Stability of Mix

| | |
|---|---|
| **Project Name** | 1. Improvement of drain at thirumenahalli village main road in ward no 05 byatarayanapura sub division.2) Improvement of road and drain at thirumenahalli junction to agrahara layout govt hospital in ward no05 byatarayanapura sub division 3)Improvement of roads and drain at chokkanahalli village main road cross road in ward no 05 byatarayanapura sub division 4) Improvement of roads and drain at markendeyanagara main road and cross roads in ward no 05 byatarayanapura sub division 5) Improvement of roads and drain at sriraj layout main road and cross road in ward no 05 byatarayanapura sub division 6) Improvement of roads and drain at kogilu surrounding in ward no 05 byatarayanapura sub division 7)Improvement of roads and drain at agrahara village cross roads in ward no 05 byatarayanapura sub division 8) Improvement of roads and drain at agrahara layout kallappa reddy main road in ward no 05 byatarayanapura sub division |
| **Client** | Executive Engineer Project Division Yelahanka Zone |
| **Job No** | MCTPL/BBMP/Project Division Yelahanka Zone /PMC/2018-19/QR/P-9/03 |
| **Mix Type** | Bituminous Concrete (BC) |
| **Contractor** | Sri. S.K. CHANDRA |
| **Test Method** | Specification for Road & Bridge Works, MORT&H, Revision V. |
| **Location** | Bay |
| **Material** | Bituminous Concrete mix |
| **Sample No** | 3 |
| **Date** | 10-Mar-2019 |

| Sl. No. | Description | Unit | Test 1 | Requirements as per MORT&H |
|---|---|---|---|---|
| 1 | Marshal Stability | KN | **9.45** | 9 KN (min) |
| 2 | Marshal Flow | mm | **3.35** | 2 – 4 mm |
| 3 | Percent of Air Voids in mix | % | **4.8** | 3 – 6 % |
| 4 | Percent of Voids in Mineral Aggregates filled with Bitumen | % | **71** | 65 – 75 % |
| 5 | Density | g/cc | **2.22** | 2.22 g/cc |

**Note:**

i. The results indicated above are based on the tests carried out on the sample at site.
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Asst. Executive Engineer
Project Division
Yelahanka Zone
Bangalore

# Test Report
## Binder Content and Mix Gradation

| | |
|---|---|
| **Project Name** | 1. Improvement of drain at thirumenahalli village main road in ward no 05 byatarayanapura sub division.2) Improvement of road and drain at thirumenahalli junction to agrahara layout govt hospital in ward no05 byatarayanapura sub division 3)Improvement of roads and drain at chokkanahalli village main road cross road in ward no 05 byatarayanapura sub division 4) Improvement of roads and drain at markendeyanagara main road and cross roads in ward no 05 byatarayanapura sub division 5) Improvement of roads and drain at sriraj layout main road and cross road in ward no 05 byatarayanapura sub division 6) Improvement of roads and drain at kogilu surrounding in ward no 05 byatarayanapura sub division 7)Improvement of roads and drain at agrahara village cross roads in ward no 05 byatarayanapura sub division 8) Improvement of roads and drain at agrahara layout kallappa reddy main road in ward no 05 byatarayanapura sub division |
| **Client** | Executive Engineer Project Division Yelahanka Zone |
| **Job No** | MCTPL/BBMP/Project Division Yelahanka Zone /PMC/2018-19/QR/P-9/03 |
| **Mix Type** | Bituminous Concrete (BC) |
| **Contractor** | Sri. S.K. CHANDRA |
| **Test Method** | Specification for Road & Bridge Works, MORT&H, Revision V. |
| **Location** | Bay |
| **Material** | Bituminous Concrete mix |
| **Sample No** | 1 |
| **Date** | 10-Mar-2019 |

| Sl. No. | Description | Unit | Computation | Test Result |
|---|---|---|---|---|
| 1 | Weight of Empty bowl before Extraction (E) | gm | Eb | 1080 |
| 2 | Weight of bowl + Sample before extraction ($w_s$) | gm | $w_{sb}$ | 1755 |
| 3 | Weight of Sample taken for the test ($S_b$) | gm | $S_b = w_{sb} - Eb$ | 675 |
| 4 | Weight of bowl + Sample after extraction ($w_a$) | gm | $w_{sa}$ | 1717 |
| 5 | Weight of Sample after extraction (i.e. washed aggregates) ($S_a$) | gm | $S_a = w_{sa} - Eb$ | 637 |
| 6 | Weight of Filter paper before extraction ($F_b$) | gm | $F_b$ | 2 |
| 7 | Weight of Filter paper after extraction ($F_a$) | gm | $F_a$ | 4 |
| 8 | Weight of filler on filter paper ($F_d$) | gm | $F_d = F_b - F_a$ | 2 |
| 9 | Weight of Bitumen without considering Filter paper ($W_b$) | gm | $W_b$ | 38 |
| 10 | Weight of the Bitumen with considering Filter paper ($W_a$) | gm | $W_a = w_b - F_d$ | 36 |
| 11 | Percentage of the Bitumen (i.e. Binder Content) ($\%_B$) | (%) | $W_a / SbX100$ | 5.33 |

| Sl. No. | I.S. Sieve size (mm) | Weight Retained (gm) | Percentage of weight Retained (%) | Cumulative Percentage of weight retained (%) | Cumulative % of Passing | | Remarks |
|---|---|---|---|---|---|---|---|
| | | | | | Test Result | Gradation Limits as per MORT&H | |
| 1 | 19.00 | 0.00 | 0.00 | 0.00 | 100.00 | 100.00 | Gradation satisfies the MORT&H Grade II Specification for Bituminous Concrete |
| 2 | 13.20 | 673.00 | 16.83 | 16.83 | 83.18 | 72-100 | |
| 3 | 9.50 | 432.00 | 10.80 | 27.63 | 72.38 | 70-88 | |
| 4 | 4.75 | 231.00 | 5.78 | 33.40 | 66.60 | 53-71 | |
| 5 | 2.36 | 486.00 | 12.15 | 45.55 | 54.45 | 42-58 | |
| 6 | 1.18 | 345.00 | 8.63 | 54.18 | 45.83 | 34-48 | |
| 7 | 0.60 | 430.00 | 10.75 | 64.93 | 35.08 | 26-38 | |
| 8 | 0.30 | 436.00 | 10.90 | 75.83 | 24.18 | 18-28 | |
| 9 | 0.15 | 387.00 | 9.68 | 85.50 | 14.50 | 12-20) | |
| 10 | 0.08 | 365.00 | 9.13 | 94.63 | 5.37 | (4-10) | |

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Project Division
Yelahanka Zone
Bangalore

# Test Report
## Binder Content and Mix Gradation

| | |
|---|---|
| **Project Name** | 1. Improvement of drain at thirumenahalli village main road in ward no 05 byatarayanapura sub division.2) Improvement of road and drain at thirumenahalli junction to agrahara layout govt hospital in ward no05 byatarayanapura sub division 3)Improvement of roads and drain at chokkanahalli village main road cross road in ward no 05 byatarayanapura sub division 4) Improvement of roads and drain at markendeyanagara main road and cross roads in ward no 05 byatarayanapura sub division 5) Improvement of roads and drain at sriraj layout main road and cross road in ward no 05 byatarayanapura sub division 6) Improvement of roads and drain at kogilu surrounding in ward no 05 byatarayanapura sub division 7)Improvement of roads and drain at agrahara village cross roads in ward no 05 byatarayanapura sub division 8) Improvement of roads and drain at agrahara layout kallappa reddy main road in ward no 05 byatarayanapura sub division |
| **Client** | Executive Engineer Project Division Yelahanka Zone |
| **Job No** | MCTPL/BBMP/Project Division Yelahanka Zone /PMC/2018-19/QR/P-9/03 |
| **Mix Type** | Bituminous Concrete (BC) |
| **Contractor** | Sri. S.K. CHANDRA |
| **Test Method** | Specification for Road & Bridge Works, MORT&H, Revision V. |
| **Location** | Bay |
| **Material** | Bituminous Concrete mix |
| **Sample No** | 2 |
| **Date** | 10-Mar-2019 |

| Sl. No. | Description | Unit | Computation | Test Result |
|---|---|---|---|---|
| 1 | Weight of Empty bowl before Extraction (E) | gm | Eb | 1080 |
| 2 | Weight of bowl + Sample before extraction ($w_s$) | gm | $w_{sb}$ | 1753 |
| 3 | Weight of Sample taken for the test ($S_b$) | gm | $S_b = w_{sb} - Eb$ | 673 |
| 4 | Weight of bowl + Sample after extraction ($w_a$) | gm | $w_{sa}$ | 1715 |
| 5 | Weight of Sample after extraction (i.e. washed aggregates) ($S_a$) | gm | $S_a = w_{sa} - Eb$ | 635 |
| 6 | Weight of Filter paper before extraction ($F_b$) | gm | $F_b$ | 2 |
| 7 | Weight of Filter paper after extraction ($F_a$) | gm | $F_a$ | 4 |
| 8 | Weight of filler on filter paper ($F_d$) | gm | $F_d = F_b - F_a$ | 2 |
| 9 | Weight of Bitumen without considering Filter paper ($W_b$) | gm | $W_b$ | 38 |
| 10 | Weight of the Bitumen with considering Filter paper ($W_a$) | gm | $W_a = w_b - F_d$ | 36 |
| 11 | Percentage of the Bitumen (i.e. Binder Content) ($\%_B$) | (%) | $W_a / SbX100$ | 5.35 |

| Sl. No. | I.S. Sieve size (mm) | Weight Retained (gm) | Percentage of weight Retained (%) | Cumulative Percentage of weight retained (%) | Cumulative % of Passing | | Remarks |
|---|---|---|---|---|---|---|---|
| | | | | | Test Result | Gradation Limits as per MORT&H | |
| 1 | 19.00 | 0.00 | 0.00 | 0.00 | 100.00 | 100.00 | Gradation satisfies the MORT&H Grade II Specification for Bituminous Concrete |
| 2 | 13.20 | 673.00 | 16.83 | 16.83 | 83.18 | 72-100 | |
| 3 | 9.50 | 432.00 | 10.80 | 27.63 | 72.38 | 70-88 | |
| 4 | 4.75 | 231.00 | 5.78 | 33.40 | 66.60 | 53-71 | |
| 5 | 2.36 | 486.00 | 12.15 | 45.55 | 54.45 | 42-58 | |
| 6 | 1.18 | 345.00 | 8.63 | 54.18 | 45.83 | 34-48 | |
| 7 | 0.60 | 430.00 | 10.75 | 64.93 | 35.08 | 26-38 | |
| 8 | 0.30 | 436.00 | 10.90 | 75.83 | 24.18 | 18-28 | |
| 9 | 0.15 | 387.00 | 9.68 | 85.50 | 14.50 | 12-20) | |
| 10 | 0.08 | 365.00 | 9.13 | 94.63 | 5.37 | (4-10) | |

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Project Division
Yelahanka Zone
Bangalore

# Test Report
## Quality of Bitumen

| | |
|---|---|
| **Project Name** | 1. Improvement of drain at thirumenahalli village main road in ward no 05 byatarayanapura sub division.2) Improvement of road and drain at thirumenahalli junction to agrahara layout govt hospital in ward no05 byatarayanapura sub division 3)Improvement of roads and drain at chokkanahalli village main road cross road in ward no 05 byatarayanapura sub division 4) Improvement of roads and drain at markendeyanagara main road and cross roads in ward no 05 byatarayanapura sub division 5) Improvement of roads and drain at sriraj layout main road and cross road in ward no 05 byatarayanapura sub division 6) Improvement of roads and drain at kogilu surrounding in ward no 05 byatarayanapura sub division 7)Improvement of roads and drain at agrahara village cross roads in ward no 05 byatarayanapura sub division 8) Improvement of roads and drain at agrahara layout kallappa reddy main road in ward no 05 byatarayanapura sub division |
| **Client** | Executive Engineer Project Division Yelahanka Zone |
| **Job No** | MCTPL/BBMP/Project Division Yelahanka Zone /PMC/2018-19/QR/P-9/03 |
| **Mix Type** | Dense Graded Bituminous Macadam |
| **Contractor** | Sri. S.K. CHANDRA |
| **Test Method** | IS : 73 – 2013 (Paving Bitumen) & Specification for Road & Bridge Works, MORT&H, Revision V. |
| **Grade of Bitumen** | VG30 |
| **Location** | Hot Mix Plant |
| **Material** | Bitumen |
| **Sample No** | 1 |
| **Date** | 6-Mar-2019 |

| Sl. No. | Description | Test Results | Requirement as per IS:73 - 1992 |
|---|---|---|---|
| 1 | Penetration at $25^0$C , 1 / 10 mm | 65 | 60 – 70 |
| 2 | Softening Point, ($^0$C) | 49 | 45 – 55 |
| 3 | Specific Gravity | 1.1 | Min. 0.97 |
| 4 | Ductility at $27^0$C, in cm | 80 | Min. 75 |
| 5 | Flash Point, ($^0$C) | 183 | Min. 175 |

**Note:**

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